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The market for cloves and clove products in the United Kingdom

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A. D. Adamson and S. R. J. Robbins

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Tropical Products Institute 56/62 Gray's Inn Road London WC1X 8LU

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Requests for further information should be addressed to:

The Director
Tropical Products Institute
56/62 Gray's Inn Road
London WC1X 8LU

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Summaries

SUMMARY

The United Kingdom imports clove products in three main forms: firstly clove buds, which, as well as being widely used in their own right, are utilised in the preparation of a ground spice, an oleoresin, and for the distillation of a clove bud oil; secondly clove stem oil, used principally *per se*; and finally clove leaf oil, also used *per se* but principally as a source of its main constituent, eugenol.

The current state of the market for clove products is principally a result of a very sharp rise in the price of clove buds in 1969, and prices have tended to stabilise at levels far higher than those prevailing in the 1960s. For a brief interval following this price rise, users of clove and its related products seemed fully content to continue using them in the expectation that prices would revert to former levels within a short time. However, with the passage of time this expectation has been shown to be ill-founded and there are now definite signs that certain users are, at least in part, substituting for or altogether omitting the clove spice and its derivatives, and that several other firms are thinking along the same lines. Thus, although the flavour and odour of clove have not yet been synthesised on a commercial scale, former users of the clove spice are now increasingly looking to less expensive sources of the special characteristics of clove, such as the cheaper clove oils or their derivatives. Nonetheless, clove stem oil, which is in some applications an adequate substitute for the more expensive clove bud oil, is also scarce and relatively expensive, and the only oil for which the market continues to be buoyant is clove leaf oil, although this is due rather to users switching to it from the bud and stem oils than to any increase in demand for the particular characteristics of clove leaf oil. However, even the prices of clove leaf oil and its derivative, eugenol, have risen a little and it is always possible that clove leaf oil might be supplanted as a eugenol source if its price, relative to that of cinnamon leaf oil which is an excellent alternative source, should rise to an unfavourable extent in the future; it is also possible in such circumstances that serious attempts would be made to synthesise eugenol on a commercial scale.

In conclusion, with the exception of clove oleoresin, for which total demand is in any case very small, and clove leaf oil, there is a detectable trend away from the use of traditional clove products, in spite of the well-known reluctance of perfumery houses and flavouring firms to depart from established formulations. It is furthermore unlikely that, once perfume and flavour formulations have been changed, a reverse change would occur in the event of a subsequent fall in the prices of the currently expensive materials.

RESUME

Le marché des clous de girofle et des produits de girofle dans le Royaume-Uni

Le Royaume-Uni importe les produits de girofle, essentiellement sous trois formes: premièrement, les boutons (clous) de girofle qui, tout en étant largement utilisés

tels quels, servent aussi à la préparation d'une épice, d'une oléorésine et pour la distillation d'une essence de bouton de girofle; deuxièmement, l'essence de tige de girofle, utilisée essentiellement telle quelle; et, finalement, l'essence de feuilles de girofle, utilisée également telle quelle, mais principalement comme source d'eugénol, son principal constituant.

L'état actuel du marché des produits de girofle est essentiellement une conséquence d'une très forte augmentation du prix des clous de girofle en 1969, et les prix ont marqué une tendance à se stabiliser à des niveaux bien plus élevés que ceux ayant cours dans les années 60. Pendant une courte période après cette élévation de prix, les utilisateurs de girofle et des produits apparentés ont semblé parfaitement satisfaits de continuer à les utiliser dans l'attente d'un retour des prix aux niveaux antérieurs dans un proche avenir. Mais, avec le temps, cette attente s'est révélée mal fondée et il y a maintenant des signes précis montrant que certains utilisateurs cherchent, tout au moins en partie, à remplacer l'épice de girofle et ses dérivés ou la supprimer et que les idées de quelques autres firmes suivent la même voie. Ainsi, quoique la flaveur et l'odeur de girfole n'aient pas encore été synthétisées sur un plan commercial, les anciens utilisateurs d'épice de girofle recherchent de plus en plus des sources moins onéreuses pour les caractéristiques spéciales de la girofle, telles que les essences de girofle moins chères ou leurs dérivés. Néanmoins, l'essence de tige de girofle qui, dans certaines applications, est un substituant satisfaisant de l'essence de clou de girofle plus chère, est également rare et relativement chère et la seule essence qui continue à se vendre sur le marché est l'essence de feuilles de girofle; mais ceci est dû au fait que les utilisateurs l'emploient à la place des essences de clou et de tige de girofle plutôt qu'à une plus forte demande pour les caractéristiques particulières de l'essence de feuille de girofle. Toutefois, même les prix de l'essence de feuille de girofle et de son dérivé, l'eugénol, ont un peu augmenté et il est toujours possible que l'essence de feuille de girofle soit évincée en tant que source d'eugénol si son prix, par rapport à celui de l'essence de feuille de cannelle, qui est une excellente source de remplacement, devait monter défavorablement dans l'avenir; dans ces circonstances, il est également possible que des efforts sérieux soient faits pour synthétiser l'eugénol à l'échelle commerciale.

En conclusion, à l'exception de l'oléorésine de girofle, pour laquelle la demande totale est petite de toutes façons, et de l'essence de feuille de girofle, on peut discerner une tendance à se détourner de l'utilisation des produits de girofle traditionnels, malgré la répugnance bien connue des maisons de parfumerie et des fabricants de condiments à abandonner les formulations bien établies. En outre, il est peu probable qu'une fois que les formulations de parfums et d'aromes seront modifiées, il se produise un changement dans le sens inverse dans le cas d'une chute future des prix des matières dont le prix est actuellement élevé.

RESUMEN

El mercado de los clavos y de los productos de clavo en el Reino Unido.

El Reino Unido importa productos derivados del clavo en tres formas principales: en primer lugar *retoños de clavo* los cuales se usan ampliamente de por sí, son utilizados en la preparación de un condimento molido, una oleoresina, y para la destilación de aceite de retoño de clavo; en segundo lugar, *aceite del tallo de clavo,* usado principalmente per se; y finalmente *aceite de hoja de clavo,* también usado per se pero principalmente como fuente de su principal constituyente, el eugenol.

El estado actual del mercado para los productos de clavo es principalmente un resultado de un aumento muy agudo en el precio de los retoños de clavo en 1969; los precios han tenido la tendencia a estabilizarse a niveles superiores de los que prevalecían en la década de 1960. Durante un breve intervalo a éste aumento de precios, los usuarios de este producto y sus derivados siguieron utilizándolos con la esperanza de que los precios volverían a los niveles normales en corto

tiempo. Sin embargo, con el transcurso del tiempo esta expectación demostró estar mal basada y actualmente hay signos difinitivos de que ciertos usuarios están, al menos en parte, sustituyendo u omitiendo este condimento y sus derivados; y que varias firmas piensan seguir esta misma línea. Aunque el sabor y olor del clavo todavía no se ha sintetizado a escala comercial, actualmente los primeros usuarios del condimento buscan fuentes más baratas que proporcionen las características especiales de clavo, tal como el aceite de clavo que es más barto, o sus derivados. Sin embargo, el aceite del tallo de clavo, que en algunos casos actúa como un sustituto adecuado del aceite de retoño de clavo, también es escaso y relativamente caro, y que el único aceite para el cual el mercado continúa siendo flexible es el aceite de hoja de clavo, aunque esto se debe más a la preferencia de los usuarios que a cualquier mejora de las características particulares del aceite de hoja de clavo. Sin embargo, aunque los precios del aceite de hoja de clavo y su derivado el eugenol han aumentado un poco y de la posibilidad de que el aceite de hoja de clavo pueda ser sustituído como fuente del eugenol si su precio, relativo al del aceite de hoja de canela que es una excelente fuente alternativa, aumentase a un grado desfavorable en el futuro; también en posible que en tales circunstancias se realice un intento para sintetizar el eugenol a escala comercial.

En conclusión, con excepción de la oleoresina de clavo, para la cual es muy poca la demanda total y el aceite de hoja de clavo, se nota una tendencia a alejarse del uso de los productos tradicionales de clavo, a pesar de la bien conocida aversión de las casas de perfumería las firmas fabricantes de condimentos para desviarse de las fórmulas establecidas. Además no parece ser posible que una vez que se hayan cambiado las formulaciones de perfumes y condimentos ocurriese un cambio contrario en caso de una caída subsiguiente en los precios de los materiales generalmente caros.

Introduction

Cloves are the dried unopened buds of an evergreen tree, *Eugenia caryophyllata,* and are produced principally in Tanzania (Zanzibar), the Malagasy Republic, Indonesia and Sri Lanka. The buds are produced in the sixth year after planting and the maximum yield is reached after some 20 years. The unopened buds, borne in bunches of 10–15, are picked by hand and the buds separated from the short stems prior to drying. The average yield of cloves is 3 kg per tree.

Clove buds contain between 16 and 17 per cent of essential oil. The dried stems and the leaves also yield a volatile oil which differs noticeably from the bud oil, yields being about 6 per cent for stem oil and 2–3 per cent for leaf oil. The basic constituent of the clove oils is eugenol, an important chemical in its own right.

This study explores in detail the United Kingdom market for the following materials: clove buds; the oleoresin extracted from the buds; the clove oils, that is the bud oil, which is generally distilled in this country, and the stem and leaf oils which are imported. The market for eugenol is also considered.

A statistical appendix is included.

Chapter 1

Clove buds

IMPORTS

In Table V of the statistical appendix to this report, the United Kingdom imports of clove buds are recorded. Separate figures for cloves were not available for the years 1968 and 1969 but an examination of the figures for the remaining years between 1963 and 1971 shows that imports varied round an approximate average of 200 tonnes. This volume of imports of cloves is considerably less than in the years immediately before and after World War II, as is shown below in Table A, which has been extracted from Table 19, FAO Commodity Bulletin Series No. 34, Spices – Trends in World Markets.

Table A

United Kingdom imports of clove buds – tonnes

1937–39 average	1947–49 average	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
600	400	700	700	300	500	600	300	400	100	200	200	200

There are two plausible reasons for this considerable reduction in imports. One is that much of the imports in the earlier years were re-exported and that the above figures record gross imports. As can be seen from Table VI, re-exports of cloves in recent years are small and appear to be following a downward trend. Indeed re-exports fell from 14 tonnes in 1963 to only 5 tonnes in 1967. London merchants confirm that the role of the United Kingdom as an entrepot in the clove trade has diminished considerably in recent years.

The second possibility is that the British housewife nowadays uses fewer cloves than in former times. Domestically, cloves are mainly used in the preparation of dishes containing apples, such as apple pies, and in baked hams. With the strong trend towards the purchase of ready-prepared foods it is very likely that this demand for cloves has diminished and has not been balanced by an increase in the industries which have benefited from the decline in home cooking, since subtle flavours such as that imparted by the clove are not normally expected from mass-produced products.

There is a lack of correlation between the recorded exports of cloves from Tanzania to the United Kingdom and the recorded imports of cloves into the United Kingdom from Tanzania, as comparison of Tables II and V in the appendix will show, and in some years – 1963 and 1967 for example – the discrepancies are large. Such discrepancies in the Trade Returns of exporting and importing countries are not uncommon. They are due partly to recording inaccuracies, particularly in developing countries, but the primary cause is often a change of ownership, and hence destination, while the products concerned are being transported. It is wholly reasonable to assume that the United Kingdom import statistics are an accurate record of the quantities of cloves entering the United Kingdom.

As the figures in Table V indicate, the United Kingdom market for cloves was, until the end of the 1960s, supplied very largely from Tanzania (Zanzibar and Pemba), with cloves from Sri Lanka (see Table IV) normally making up the balance. In the late 1950s and early 1960s, cloves from the Malagasy Republic were imported into the United Kingdom in sizeable quantities but supplies from this source then dwindled to negligible quantities (see Table III). The reason for the predominance of Tanzania in the United Kingdom market was that whereas supplies from the Malagasy Republic attracted a duty of 10 per cent *ad valorem,* supplies from Tanzania, which is a member of the Commonwealth, entered the United Kingdom free of duty; consequently Malagasy cloves tended to be rather more expensive than Tanzanian cloves. Cloves from Sri Lanka were also comparatively expensive but they continued to find a ready market on account of their reputation for high quality in respect firstly of size of bud, and secondly of freedom from foreign matter in shipped consignments. However, the past four years have seen a major transformation in the structure of United Kingdom imports, and again Table V tells the full story. Supplies from Tanzania have collapsed and are now of negligible proportions, while the Malagasy Republic is once again a supplier of some importance as also, for the first time, is Singapore. Of this more will be said later.

The appended statistics record a clove import of 320 tonnes for 1968: this figure is only an estimate, since for this year (as also for 1969) separate statistics for the import of the clove spice have not been recorded. Assuming for the moment that the estimate is correct, a plausible reason for this high figure is that there was word of a forthcoming shortage of cloves and London merchants bought up extra cloves for stockholding, to be sold eventually to users in the United Kingdom or to foreign interests. Whatever the reason, it seems unlikely that the ultimate demand from users of cloves suddenly rose to a level of 320 tonnes per annum.

TRADE STRUCTURE

The trade in cloves with Tanzania (Zanzibar) has changed significantly since the political changes there in early 1964, according to members of the United Kingdom trade. Before then, production in Zanzibar and Pemba was carried out on many small plantations. The Clove Growers' Association was an organisation set up by the growers themselves in an attempt to regulate the supply of cloves flowing on to the market, the intention being that this association would hold a buffer stock from the good years to sell in the lean years. However, the market was essentially a free one, the growers being permitted to sell to local exporters when the price offered was above that guaranteed by the CGA. This stockholding policy, which appears to have been fairly successful, was considered particularly necessary with cloves because the crop is of a biennial nature, the harvest in alternate years being large and small as Table I will show. For example, a crop of 15,200 tonnes in the crop year 1961–62 was followed by a crop of 5,900 tonnes in the year 1962–63. The reasons underlying the biennial nature of the clove crop are still not fully understood. However, no matter how successfully the Clove Growers' Association regulated the flow of supplies on to the world market, prices still fluctuated because of the influence of the major demand for the world's clove supplies, namely from Indonesia, where cloves are blended with tobacco (about 25 per cent of cloves to 75 per cent of tobacco) in the production of the local cigarettes. This demand was not particularly stable and in consequence prices oscillated considerably.

After January 1964 the situation changed. Unfortunately it is impossible to discover the exact nature of the changes in the clove trade since very little relevant information comes out of Zanzibar. However it appears that the clove trade is now dominated by the Zanzibar State Trading Corporation, a government organisation which, although it probably does not own the plantations, exercises control over the marketing of all supplies. For a time this appeared to be the sort of situation in which a virtual monopoly might have arisen but the existence of a large alternative supplier in the Malagasy Republic and also one dominant buyer,

namely Indonesia, meant it was never very likely that the Zanzibar State Trading Corporation could assume and exploit a monopolistic position even if it wished to do so. Within reason, however, it does set its own price although in this respect it is undoubtedly influenced by the overall state of the world market.

Because of the nature of this supply structure, merchants in the United Kingdom tended to drop out of the clove trade after 1964, believing that with a fixed supply price they could make little or no profit in the clove trade (although, as it turned out, large profits would have been made by anyone holding stocks of cloves at the time of the recent shortage). The price of Zanzibar cloves, c.i.f. London (Table XII) remained at just over £0.30 per kilogram for the third quarter of 1964 until the third quarter of 1967, when it began to rise slowly. The big rise occurred only at the beginning of 1969.

Thus after the political changes in Zanzibar, the United Kingdom trade was left in the hands of brokers who work on a commission basis, charging perhaps ½–1 per cent for their services. This is a fairly low charge and therefore almost all the users of clove buds were quite willing to buy their supplies from the established London brokers. The general position was therefore one in which two or three shipping companies normally conducted direct dealings with the Zanzibar State Trading Corporation, working sometimes on a commission basis but quite frequently financing their own purchases and thus performing the function of a merchant. These shipping companies normally sold through the brokers to a wide variety of final users, although in a few cases shipping companies entered into direct agreements with large final users.

THE PRESENT SITUATION

There has been a dramatic upheaval in the clove trade recently. As Table XII shows, the price of Zanzibar clove buds, cif London, began to rise in the last quarter of 1967, rising to £0.42 per kilogram in the third quarter of 1968. There was a slight easing of the position in the fourth quarter of 1968 and then a very sharp rise to £1.33 per kg in the first quarter of 1969, followed by a further rise to £1.82 per kg in the second quarter. For a while prices stabilised around this level and were widely expected to ease back somewhat, but at the beginning of 1974 yet another sharp rise occurred and prices now stand at an all-time high; the current shipment price for Zanzibar cloves stands at £2.45 per kg, the Malagasy price is similar and Sri Lanka cloves are currently quoted at £2.70 per kg. Because of the lack of information emanating from Zanzibar in particular, the causes of the original very large price rise are still not wholly clear. However, it has been reported[1] that by 1969 production was failing to meet export demands, the stockpile was depleted and new buyers were appearing on the market. China offered to buy 600 tonnes of cloves at almost double the going rate and one US company was said to have enquired about 500 tonnes at a price of £1,200 per tonne. The Americans finally bought 100 tonnes at £1,650 per tonne and Indonesia is reported to have bought some 3,000 tonnes at that price. By this time the Zanzibarians realised that they were in a sellers' market and they introduced a heavy special duty on cloves which eventually caused the price to settle at its new high levels. Of the existence of severe shortages there can be no doubt. As Tables I and II show, sales from Zanzibar between 1965 and 1970 exceeded production during the same period, the difference being accounted for by the depletion of a stockpile which in 1971 stood at around 5,000 tonnes.

The 1971 crop yield was estimated at approximately 5,000 tonnes and that of 1972 between 3,000 and 4,000 tonnes, so during these two years Zanzibar could have supplied up to 14,000 tonnes for export. The reason for the gradual decline of the Zanzibar crop during this period can most realistically be attributed to the fact that there was a shortage of pickers, in consequence of which the cloves were left on the trees and the plantations tended to become overgrown. There were

[1] Financial Times, December 2 1971

unconfirmed reports of a major recovery in clove production during 1973, but at the end of 1973 supplies from Zanzibar were reported[2] to have dried up following the commencement of price negotiations between Zanzibar and Indonesia. No details are available on these negotiations but supplies from Zanzibar were not expected to recommence until the negotiations have been concluded, and it was the resultant shortage that caused the 1974 price rise. Madagascar's 1973 crop was reputed to be poor and only Sri Lanka is regarded as a reasonably reliable source at the present time, although the quantities exported are comparatively small.

A real world shortage in a product such as cloves is frequently aggravated by the activities of merchants and users at the importing level. In expectation of a shortage, stocks are rapidly bought up and this only serves to worsen the situation; as already mentioned, the high UK imports of 1968 can be explained in terms of this stock-building policy. But as the shortage increases and prices become very high, the expectations of users and merchants change. They come to believe that the price has reached its peak and must sooner or later fall to what they consider to be a normal level. So they become unwilling to hold stocks of the commodity fearing to buy at a higher price than that likely to prevail when they come to sell. This exceptional change serves to ease the overall shortage. These developments have certainly taken place in the context of the current clove shortages and since the price reached its new level, the United Kingdom trade has been working only on a hand-to-mouth basis, buying solely for clients' immediate needs. Consequently users of cloves have at times experienced some difficulty in obtaining their normal supplies.

As far as the United Kingdom market is concerned the principal result of the situation described above has been a gradual loss of confidence in the dependability of Zanzibar as a regular source of supply and an increase in imports of cloves from alternative sources. As previously mentioned, the Malagasy Republic has recently recommenced the supply of cloves to the UK in substantial although highly variable quantities, and imports from various other sources have increased as Table V shows. There is general uncertainty at the present time regarding supplies from the Malagasy Republic, firstly on account of the comparatively unfavourable price/quality ratio compared, for example, with supplies from Sri Lanka, and secondly owing to the fairly recent interruption in supplies which accompanied major internal political changes. Importers and users are understandably rather more price-conscious than in former times and it is for this reason that the emergence of Singapore as a regular supplier has a special significance. An agreement is known to exist between the Malagasy Republic and Singapore by which cloves destined for Indonesia via Singapore are traded at a price somewhat lower than the ruling world price; this fact has gradually come to the notice of UK clove importers who, it is reliably reported, have managed to obtain from Singapore substantial quantities of cloves, which would otherwise have found their way to Indonesia, at the reduced price.

All that remains to be said regarding the current situation is that, the Tanzania-Indonesia price negotiations apart, the continuing high world price of cloves is attributable principally to two factors; firstly the continuing tendency for total world demand to exceed supply, and secondly the fact that world demand for cloves appears, at least within present price ranges, to be comparatively price-inelastic.

END-USES OF CLOVES

It is impossible to give a precise breakdown of the various uses of cloves. Official statistics are not available. Brokers may be understandably reticent about the volume of their business and the identity of their clients, and in any case may not

[2] Financial Times, February 14 1974

be aware of the purposes for which their clients use cloves, while users may regard both the extent and nature of their usage of cloves as confidential. However, by a process of deduction from information obtained from a variety of firms the following quantitative breakdown emerged: culinary 40 per cent, industrial 20 per cent, distillation 35 per cent and oleoresin extraction 5 per cent. Such a breakdown is of course tentative and should be regarded only as a guide to orders of magnitude.

The end-uses will now be discussed in turn.

Culinary – The estimate of 40 per cent of clove imports for culinary use is the least reliable of the estimates since it is the residual quantity after deductions have been made for the other uses. This 40 per cent is an estimate of those cloves sold at the retail level, in supermarkets and grocers, to the housewife. The cloves are sold in both whole and ground form, the majority probably still being sold in whole form for use in such traditional dishes as baked apples. The majority opinion of brokers and wholesalers is that the use of cloves by the housewife has diminished over the years but that the majority of the United Kingdom's clove supplies is nonetheless still used at this level; the available evidence, however, does not uphold this latter view – if anything, the estimate of 40 per cent is probably too high rather than too low.

Almost all of the cloves sold at the retail level are sold in ¾oz (21g) or 1oz (28g) packages through a great number of outlets. Several of the larger supermarket and grocery chains were contacted, and it appears that even a large supermarket chain is unlikely to sell more than a tonne in a normal year. As one might expect, the demand for cloves at this level appears to be very inelastic; 1oz (28g) of cloves is normally sufficient for the needs of the average housewife for several months, and even substantial price changes are unlikely to influence the quantity she buys. Cloves currently retail at between 10p and 16p per ounce (28g) compared with 4p five years ago, but this does not appear to have influenced the housewife unduly. It would therefore appear that this part of the United Kingdom clove market is secure from any sudden decline provided supplies continue to be available, although of course it may continue to be eroded by the trend to ready-prepared foodstuffs.

Industrial – Industrial, general purpose use of whole or ground cloves has been assessed at 20 per cent. If this estimate errs, it is if anything more likely to be on the low side. The bulk of the cloves used in industry are bought in whole form and ground by the user firms. Apart from a variety of small flavour uses (none of which is by itself large but which nonetheless probably amount in aggregate to a few tonnes), almost all of these cloves are used in the production of sauces and pickles, and the greater part of the total is used by one firm alone. The demand for cloves in this sector is moderately stable, although less so than formerly; the clove spice is rarely used on its own, more often being blended with a variety of other spices and used as an ingredient in various sauce and pickle formulae. Thus the clove flavour is not becoming more popular in itself, and any future rises in industrial demand are likely to occur only as part of a general rise in sales of the end-products. With regard to the elasticity of demand in industry, although the 1969–70 price rise has not had a drastic effect on demand; it has nonetheless quite evidently induced some manufacturers to examine seriously the possibilities of using substitutes for the clove spice. Firms are undoubtedly accustomed to temporary price rises in spices and they tend to accept such situations and hopefully await a return to normal rather than alter flavour blends to which the consumer has become accustomed. But when a period of high prices becomes protracted, as in the present situation, it is more likely that steps will be taken either to use a substitute for or even simply to leave out the relevant spice. Furthermore the latter decision, once taken, is extremely unlikely to be reversed in the event of a return to normality in respect of price and availability of the formerly-used spice. There is certainly evidence that attempts have been made to substitute, say, clove stem oil or clove leaf oil for the ground spice and it does seem as if the demand for cloves in industry is likely to diminish unless prices fall within the fairly near future.

Distillation – The estimate of 35 per cent given for clove buds which are used in the distillation of clove bud oil in the United Kingdom should be regarded as a maximum figure, and is based on very approximate production figures provided by the few firms which distil this oil. On current indications, the average quantity of buds distilled for oil lies somewhere between 65 and 100 tonnes per annum, and seems to vary considerably from year to year. Trade opinion is that clove bud distillation is a very minor activity and it therefore seems reasonable to accept the lower limit of 65 tonnes as being the more realistic. But if the larger figure were more accurate, the estimate for the quantity of cloves used at the household level would be under 40 tonnes rather than around 75. With a yield of 16–17 per cent, and accepting the lower limit of 65 tonnes as reasonable, the quantities of bud oil distilled in the United Kingdom would appear to amount to rather over 10.5 metric tons. Clove bud oil is discussed in more detail in the section on clove oils.

Oleoresin Extraction – All matters relating to the oleoresin of clove will be considered in this section. The oleoresin of clove is prepared by extraction with a variety of solvents; the solvent is evaporated, and the oleoresin is left as the residue. The advantage of the oleoresin over the distilled oil is that it contains more of the odour and flavour principles than does the oil, which is generally steam-distilled and therefore does not contain the non-volatile principles of cloves.

There appears to be only one firm in the United Kingdom which extracts the oleoresin of clove.* It normally markets the oleoresin in direct competition with the dry spice. This is possible because the oleoresin is not sold as such but is dispersed on a neutral base (eg salt, dextrose, flour, rusk) and sold as, weight for weight, equivalent in strength to the dry spice. Its advantages over the dry spice are that it avoids the risk of bacterial contamination and that it is standardised in strength and quality to a greater extent. There appears to be minor competition from the United States in this market, albeit amounting to no more than a few kilogrammes per annum. With a 10 per cent import duty and the fact that industrial demand is essentially for the oleoresin already dispersed on a base, such competition is not expected to develop to any significant extent in the near future.

The demand for the oleoresin of clove does not appear to have made a very great impact on the demand for the ground spice, with which it competes. The approximate estimate is that 5 per cent, that is up to 12 tonnes, of clove buds are used in the extraction of clove oleoresin. In fact, these 12 tonnes will produce 14–15 tonnes of the dispersed extract mentioned above, since the flavour and odour principles are more freely available in the oleoresin than in the ground spice.

Apart from several small demands for a few kilogrammes of oleoresin, the bulk of the product is marketed in the form of a dispersed extract. The above estimate of the quantity of dispersed extract marketed is not, perhaps, very accurate; it is based predominantly on the demands of the very few large firms in the food industry, where the dispersed clove extract is used in the flavouring of a variety of meat and soup products. One large firm, which at present uses perhaps eight tonnes of dispersed extract per annum, believes that there is a general swing towards the use of this form. However, it is unlikely that the sauce and pickle manufacturers will completely abandon the ground spice in favour of the dispersed extract.

The price of the dispersed extract has, as would be expected, risen proportionately with the rise in price in clove buds, and the same comments apply to demand for this material as applied to industrial demand for the spice itself.

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* Another, much smaller, firm has stated that it is producing a 'clove absolute' but no information on its product was available.

Chapter 2

The oils of clove

Each of the three oils of clove, that is bud, stem and leaf, is considered separately as far as possible. Clove bud oil differs from the other two, in the context of this report, principally in so far as usage of this oil in the UK is restricted mainly to oil distilled in the UK rather than in the clove producing countries.

CLOVE BUD OIL

Clove bud oil is generally steam-distilled from the clove buds. Distillation used to take place mainly in the consuming centres and this still applies to the UK to a large extent. The reason for this is that users desire a high quality oil which gives as close as possible a reproduction of the odour and flavour of the clove spice itself. There are obviously advantages in distilling the buds at source since the cost of shipping the oil would be markedly lower than for the much bulkier clove spice, but to those who normally create the demand for clove bud oil the price of the English-distilled product is amply justified by its very high quality.

Distillation in the United Kingdom — The quantities distilled in the United Kingdom, estimated in a previous section to be of the order of 10.5 tonnes (but just possibly a few tonnes more than this) increased slowly but steadily during the 1960s, the peak of between 12 and 16 tonnes occurring around 1970. Since the large price increase for clove buds, however, production has noticeably fallen back and it is quite possible that it may not recover to its former levels.

Prices — Before the political changes in Zanzibar, cloves were sorted into four grades, the lowest one being cloves sold for distillation. This system appears to have ceased; with the advent of shortages at the end of the 1960s, it became unlikely that even the poorest cloves would be sold to the distillers at a reduced price. As is noted in Table XIII of the appendix, clove bud oil has had a varied price history, being relatively expensive in the late 1950s and falling gradually to a low of £2.98 per kg by the fourth quarter of 1961. A period of fairly stable prices followed until the beginning of 1968 when the price rose from £3.09 per kg to £3.86. By the end of 1968, the price had risen to £6.40 and by the beginning of 1969 to £11.03. It continued to rise to an unprecedented height of £14.88 per kg and then, after a pause, to £21.50 per kg at which level it remained, save for a small temporary fall, for nearly two years, and only recently has it fallen back to its current level of around £19 per kg. The present position is very different from the beginning of the last decade when Arctander* wrote that there was little to be gained from 'cutting' clove bud oil with leaf or stem oil. He believed that adulteration would not become a reasonable proposition until the price of bud oil had increased by a factor of two or three — and an even greater increase has now taken place.

The Malagasy bud oil is currently priced at around £13 per kg.

* Steffen Arctander, 'Perfume and Flavour Materials of Natural Origin', published by the author in 1960.

Uses — The uses of clove bud oil are numerous, both in the flavouring and the perfumery industries; it used also to have a variety of applications in the pharmaceutical industry, but since these depend on its eugenol content it has been largely replaced by eugenol itself or by clove leaf oil, both of which are considerably cheaper. In the perfumery industry, clove bud oil blends well with the derivatives of eugenol eg aceteugenol, methyl-eugenol, iso-eugenol, to form part of the well-known 'carnation' base. It also blends well with many other materials, adding a sweet-spicy note to the final creation. In flavour outlets, clove bud oil has a variety of uses in meat products, snack products, baked products and confectionery. It has on rare occasions been known for clove bud oil to be used as a starting material for the isolation of eugenol, this expensive eugenol being demanded by one or two very discriminating customers. It is difficult to say how much of the bud oil is used in the different industries, but from estimates made by the distillers it would seem that perhaps 60 per cent of the clove bud oil in the United Kingdom market goes to the flavour industry, and most of the remaining 40 per cent to the perfumery industry.

Future Prospects — Despite the fact that clove bud oil is traditionally a relatively highly priced product and yet has retained its demand on account of its high quality and of the conservative attitudes of both the flavour and perfumery industries, it is now clear that the current exceptionally high prices have curtailed the demand for this oil. The perfumery industry is understandably reluctant to change an accepted and successful formula but in this case many of the firms in the industry have done so, although of course details of the revised formulae tend to be kept confidential. At the lower quality end of the trade, for example in perfumes for use in soap and detergent compounds, bud oil has been replaced, and one large user substituted three tons of stem oil for bud oil in soap compounding. Added to the effects on demand of the high price of the bud oil, there is an absolute shortage of this oil because of competitive demands for the whole cloves. If, for either reason, a perfumer is forced to alter his compound, it is very unlikely that he will ever revert to the old formula, which made use of the comparatively expensive bud oil. It is difficult to provide an order of magnitude for the degree of substitution because many firms are perhaps unwilling to admit that they are, however necessarily, having at times to stretch their short supplies of bud oil. Contacts in the trade tended to state either that they already had replaced or stretched their bud oil — or were considering taking such steps — or on the other hand that the bud oil was an indispensable ingredient which could not be omitted. It is likely that the number of firms taking the latter line will further diminish if prices remain at present levels.

The use of clove bud oil in the flavouring industry is widespread but very difficult to gauge since the total quantity used is compounded of many small quantities used by different firms in a variety of products. Considerable investigation was undertaken in the confectionery industry in the course of this survey but it was found that clove bud oil or, indeed, a clove flavour of any form, was used by only a few firms and then only in one or two specialised lines, and in quantities not exceeding a few hundred kilogrammes for any one firm. The above comments on the nature and strength of demand for clove bud oil in the perfumery industry apply also to the flavour industry. Yet it is possible that the flavour industry is less willing to change from the use of bud oil to a cheaper and more readily available alternative. The fact that the demand from any one firm is not very large perhaps increases their ability to withstand price rises. It is also probable that the alternative materials are poor substitutes in flavouring, and this seems to be borne out by the fact that in certain applications in which the clove flavour is said to be becoming rather more popular, such as in toothpaste, bud oil is the preferred material. Few cases have come to light where the leaf oil is used in flavouring while the stem oil, a more plausible substitute, has often been and remains in short supply and so was not readily available for substitution. However, there have been instances of an absolute lack of supplies of the bud oil, and in such cases an alternative has to be found.

It is possible that small quantities of English distilled clove bud oils are exported but no figures are available in this respect.

Imported Clove Bud Oil – The UK market for clove bud oil distilled at source is a little difficult to gauge. Prices for Zanzibar-distilled oil are shown in Table XIII. A little of this oil has been imported into the United Kingdom from time to time but UK users do not appear to be interested in it. In any case, given the price of clove buds relative to the price of this bud oil at different periods of time, it is reasonable to assume that this was a mixture of clove bud oil and one of the other clove oils. Thus at mid-1969, clove buds were selling for £1.82 per kg while clove bud oil was selling for only £3.59 per kg. With a distillation yield of some 16–17 per cent, the Zanzibar oil would seem to have been incurring a loss if in reality it was a true bud oil.

Recently, however, the Malagasy Republic has entered the clove bud oil market and is now a substantial supplier. The new oil has made a considerable impact on the USA market for clove oil but its acceptance in the UK has been limited owing to the strong preference for English-distilled oil. At its current price of around £13 per kg it is cheaper than English-distilled oil but the essential oils trade is not expecting demand for this oil to increase much above its current level of 1–2 metric tons per annum.

The Impact of Synthetics – There appear to be no simulated odours of clove based on non-clove materials available on the UK market but as a result of the price rises which have affected all the oils, and bud oil in particular, compounders have been blending the bud, leaf, stem oils and eugenol together to obtain a cheaper product and these oils sell at from 15 per cent to 50 per cent of the price of a true bud oil. However, in the USA a leading synthetics manufacturer has recently announced a new synthetic clove bud oil reputedly capable of offering full replacement value for the natural oil in flavour and fragrance applications. Further details are not yet available.

CLOVE STEM OIL

Clove stem oil is steam-distilled from the stems upon which the clove buds grow. The distillation used to take place only in Zanzibar, where the entire output of clove stems was distilled on the spot at the modern distillery in Malindi. Zanzibar-Pemba traditionally insisted on the removal of the stems from the clove buds and thereby utilised the valuable product by distilling an essential oil. At the time when all clove stem oil available on the market originated in this one distillery, it was one of the most uniform of all essential oils. However, Madagascar has recently commenced production of stem oil although as yet comparatively little has reached the United Kingdom.

Production and Trade – No clove stem oil is produced domestically and United Kingdom trade statistics do not differentiate between imports of the three types of clove oil (see Table IX). Until 1968 UK imports of stem oil from Tanzania averaged 50 tonnes annually. Since then imports from this source have declined dramatically, only three tonnes being imported in each of the years 1970 and 1971 (see Table VII). The reason behind this is thought to be the chain of events, already discussed, which have affected Zanzibar's production since 1969. Trade sources contacted during the last few months have expressed the opinion that Zanzibar has lost the market for stem oil, which has now to some extent been replaced and now accounts for only 8 per cent of total UK usage of clove oils.

As Table X shows, the United Kingdom re-exports significant quantities of clove oil. Trade opinion conflicts as to whether the bulk of these re-exports consist of clove stem oil or clove leaf oil, but one London broker believes that only very small quantities of stem oil have been re-exported.

Trade Structure – The same broker used to work on a commission basis, supplying all users of stem oil. For a while, users seemed content with that situation but gradually a situation arose in which individual firms made offers direct to the Zanzibaris, who were prepared to accept such alternative arrangements. It was this development which probably caused the exceptionally high imports of clove oil in 1968. Since that time, of course, supplies have been short and nobody has been able to buy in large quantities.

Prices – Published price statistics for clove stem oil are not available but sufficient information is available in the trade from which to construct a picture of the price trend. Until the onset of the recent shortage, beginning in 1968, stem oil prices were stable at between £1.30/kg and £1.90/kg but then a rapid rise ensued and by the end of 1969 prices were between £2.20 and £3.05 per kg. The situation worsened, supplies from Zanzibar becoming more and more intermittent, and from import values calculated from the figures given in Table IX for 1970–71, it appears as if prices continued to increase to around £6.15/kg. Current prices are now a little below this peak and are in the region of £5.90 to £6 per kg.

Uses – Clove stem oil, part of which is redistilled by the buyers and part used in the form in which it is imported, is used in the same industries as clove bud oil, namely the flavouring and perfumery outlets. In flavouring, the stem oil is essentially a low-cost replacement for the more delicate and true-to-nature clove bud oil. Stem oil, which is guaranteed to contain not less than 90 per cent eugenol, was at one time quite widely used as a starting material for the isolation of eugenol, and indeed it is still used in this application to some extent, but for several years clove leaf oil has been the major raw material for this purpose. It seems clear that the bulk of stem oil supplies find their way to the perfumery industry. Several tonnes (perhaps 16–20) are used in the compounding of perfumes for soaps and detergents, not to mention the very small demands in the finer perfumery industry. The food industry, however, appears to be increasing its share of the market for this oil as users of bud oil switch to stem oil, which is a much cheaper, if considerably inferior, source of their flavour requirements; up to 15 tonnes are thought to be used in this field. The only other outlet of any importance is the pharmaceutical industry but here the prevalence of very small individual demands precludes accurate estimates of total usage, although it is unlikely to exceed 3 tonnes and appears to be decreasing.

Future Prospects and the Impact of Synthetics – The high price of cloves and of clove bud oil inevitably caused clove stem oil to appear an increasingly attractive substitute, and in spite of assertions that stem oil differs greatly from bud oil in respect of odour and flavour, several small users made the change and one larger user substituted three tonnes of stem oil for bud oil in soap compounding.

However, stem oil has nonetheless been both expensive and in short supply and this has been to the advantage of clove leaf oil, again in spite of a body of opinion that leaf oil is no substitute for stem. Severe cuts in demand have been noted as supplies of stem have repeatedly dried up and substitution has been forced on many users; and once the affected users decide that leaf oil or its derivatives can be used as an adequate substitute, past experience indicates that it would be most unlikely for reversion to the use of stem ever to occur. If anything, demand for stem oil is more secure in the flavour industry where it still seems doubtful whether leaf can substitute for stem oil at all adequately, but leaf oil has nonetheless made some inroads into this market, and in many cases stem oil is being extended with leaf oil, eugenol and other materials.

Like bud oil, stem oil faces no real competition from materials synthesised from non-natural sources.

CLOVE LEAF OIL

The essential oil of clove leaf is distilled from the whole leaves and twigs of the clove tree. Distillation takes place mainly in the clove growing areas of north-eastern Madagascar, but also in recent years in Indonesia.

The odour of clove leaf oil is somewhat harsh and distinctly different from the odour of its main constituent, eugenol, and different also from the odour of clove bud oil. Woodiness and dryness are probably the most typical notes of clove leaf oil.

Production and Trade — With reference to Table IX it can be assumed that the clove oil from the Malagasy Republic, from Indonesia and from Australia is in fact the leaf oil. Australia is reported by one UK trade source to be exporting leaf oil of Indonesian origin.

By aggregating imports from these sources an estimate of the total UK market for clove leaf oil can be made.

The market in fact has expanded in the period under review to more than double its size in 1961, when imports were 60 tonnes. In 1971 estimated imports totalled 141 tonnes. Additional supplies from Indonesia and Australia have compensated for a decline in Malagasy supplies. Certainly Indonesia has done much to revive her clove plantations and her exports appear likely to figure even more largely on the market in future.

The problem of how much clove leaf oil was re-exported in these years arises, and again there is no way of establishing this with any precision. Opinions in the trade vary and lead to no positive conclusion, but on balance it seems probable that significant quantities of clove leaf oil are re-exported.

Trade Structure — The structure of the trade in clove leaf oil in the United Kingdom is typical of the trade in essential oils. The trade is conducted through several brokers and merchants in London, and these middlemen serve a variety of users. One or two of the largest users have at times tended to bypass the London brokers, while at other times they are quite content to buy from them.

There is a consensus of opinion in the trade that the bulk of Malagasy clove leaf oil supplies are bought through French dealers. From the relatively small recorded imports of clove oil from France, it is clear that by and large this means that the supplies do not pass physically through France, but rather that the French dealers agree to supply London dealers with oil. Just as the United Kingdom has in the past had traditional trade and cultural ties with Zanzibar, so France has similar ties with the Malagasy Republic. Again, however, there is diversity in the trade and London brokers, and even one of the largest users, will at times deal directly with Malagasy exporters. There is no hard and fast rule, and no question of London dealers being excluded in any way from the Malagasy end of the trade; the situation is simply that, under normal conditions, the United Kingdom trade finds it convenient to buy supplies of clove leaf oil through the French dealers and to pay a small commission for this convenience.

Prices — On a quarterly average basis, prices are shown for clove leaf oil from the Malagasy Republic and also for oil from the Seychelles in Table XIV.

The clove leaf oil market is an open one conducted under conditions of private enterprise and the price has naturally varied a great deal. Malagasy material remained relatively stable in price between 1961 and 1966, ranging between £0.64 per kilogram to £0.83 per kg. Then during 1967, as clove supplies became more uncertain, the price gradually began to climb reaching £1.13 per kg in that year. This upward trend continued into 1969 and a peak of £1.55 per kg was reached, but prices have since eased and in 1971 stood at £1.31 per kg. In 1972 Malagasy clove leaf oil was offered at £1.25 per kg and by February 1973 its price had fallen to £0.95. Subsequently, however, the downward trend was reversed very dramatically. It is difficult to pinpoint a single cause, but it is clear that there was a sudden temporary surge in demand at the end of 1973, at a time when the oil was, for a few months, in very short supply for reasons largely unknown. This, combined with the general effect on prices of the 1972/73 commodity boom, forced the price of clove leaf oil up very sharply indeed to

well in excess of £4 per kg in early 1974, and even now it stands at £4.10 per kg although it is slowly falling.

Seychelles oil was quoted between 1961 and 1969, during which period relatively little price movement was experienced: the price range was £0.65–£1.19 per kg on an upward trend. No Seychelles oil has been on offer recently and in fact the Seychelles have never been a major supplier, comparatively speaking.

Malagasy oil is required to have a minimum eugenol content of 82 per cent. It is however reported that Indonesian oil, which used to have a reputation for decidedly inferior quality and low eugenol content, now contains 80–82 per cent eugenol and is often preferred to oil originating in Madagascar. The most recent (July 1974) price for this oil is reported to be about £3.32 per kg and falling slowly but steadily. There have been times during which Indonesian prices were higher than Malagasy prices owing to exceptionally high local rates of inflation in Indonesia, and this was true during the initial stages of the recent price increases. However, owing to the greater severity of the Malagasy oil shortage the Indonesian oil is now cheaper. It is generally felt that in the long term there will be no appreciable difference between the prices of the two oils.

Uses – The major demand for clove leaf oil is as a raw material for the isolation of eugenol, its major component and, for example, 50–70 tonnes of the oil were used for this purpose in 1970. It has not been possible to arrive at accurate estimates for the complete breakdown in end-uses of this oil, but it seems reasonable to assume that the demand for clove leaf oil as an ingredient in its own right is much the lesser demand. Of the clove leaf oil used *per se* in the UK it is estimated that some 80–90 per cent is used in the perfumery industry. Clove leaf oil is normally used at the medium to lower end of the perfumery trade, in the cheaper perfumes such as the 'carnation' group, where either the leaf oil itself or its derivatives can amount to as much as 10 per cent of the perfume compound. Most, however, is used in soap perfumery, where several tonnes are employed in a variety of compounds. This use of the leaf oil, and the much greater quantities of eugenol similarly employed, remains high and may even be increasing, in spite of the risk of discolourations at the higher concentrations which the use of these materials involves. However, clove oil and eugenol cannot be used in the preparation of white or very pale soaps. Perhaps as much as five tonnes of clove leaf oil find their way into the furniture polish industry, one user incorporating the oil in its products so as to mask less pleasant odours with a dominant and attractive fragrance.

Supplies of the oil from the Malagasy Republic are usually rectified before use, generally by the supplying firm rather than by the final user. It has already been mentioned that until very recently the leaf oil found very little use in flavour work, since its flavour was not considered to be an adequate reproduction of that of the clove spice.

Clove leaf oil also has some use in pharmacy; it is difficult to gauge how much but its use is declining and in any case it is very likely that the isolated eugenol is of greater importance in this application. The subject of eugenol will now be examined separately.

A note on eugenol—This chemical is the principal constituent of the clove oils, particularly clove leaf oil. It is an important material in its own right and, like clove leaf oil, has some pharmaceutical usages. As stated above most of the supplies of clove leaf oil entering the United Kingdom are used for the isolation of eugenol, which has had a somewhat chequered career. Over twenty years ago, all the vanillin in the United Kingdom was prepared from eugenol, the demand for vanillin amounting to 20 to 30 tonnes per annum. However, eugenol was gradually supplanted as the raw material for the production of vanillin by lignin residue from the sulphite wood pulping process, which is a very much cheaper product. This substitution was probably completed by the late 1950s, and it is doubtful whether any vanillin at all is still produced using eugenol as a starting material, in spite of a

lingering belief that eugenol-based vanillin is superior. The import statistics demonstrate that clove leaf oil has more than recovered from this blow which must have reduced demand to a significant degree for a time.

Eugenol itself can be isolated from a variety of starting materials, and although the end-products are not identical they are for most practical purposes interchangeable. Since 1964 clove leaf oil has clearly been the cheaper source of eugenol and even the recent price rises have not altered this situation (cf. Tables XIV and XVI). Before 1964 clove leaf oil and cinnamon leaf oil vied for this position and they were used alternately depending on whichever was cheaper; clove leaf oil contains 80–85 per cent eugenol and Seychelles cinnamon leaf oil 95 per cent. When, after 1964, supplies of cinnamon leaf oil from the Seychelles diminished somewhat, the price of the latter oil rose and the field was left entirely to clove leaf oil. Towards the end of 1972 the prices of the two oils tended to converge and one or two manufacturers of eugenol made it clear that cinnamon leaf oil would certainly be used again if the price differential were to warrant it, but currently the differential is again clearly in favour of clove leaf oil.

Eugenol is used essentially in two industries, the perfumery industry and the pharmaceutical industry. Official statistics on eugenol are not available but it is evident that very much larger quantities are used in perfumery, amounting to perhaps as much as 90 per cent of total supplies. Eugenol is smoother in odour than clove leaf oil, or any other clove oil for that matter, and will produce a less definite clove odour in the final product. By the relative size of its use, this appears to be a highly desirable attribute in certain uses. Eugenol is used mainly at the lower end of the perfumery scale, in soap and detergent work. Not only eugenol itself, but other derivatives such as iso-eugenol and methyl-eugenol, find use in perfumery work where there is a demand for a few tonnes per annum for each of these materials. These derivatives have the advantage that they do not discolour the products in which they are used, but on the other hand they lack the spicy odour of the eugenol itself.

Eugenol is characteristically associated with its use in pharmacy, where it acts as an anti-carminative and an antispasmodic; it is also used in dentistry where it is mixed with zinc oxide to make temporary fillings for cavities. The usual problems encountered in an attempt to quantify demand are even more in evidence here. All such uses appear to be individually small; a dentist buys eugenol in 100-gram packs which may last him for several months. Contact with the Association of British Pharmaceutical Industries has led to the conclusion that only a few hundred kilogrammes of eugenol per annum were used in the pharmaceutical industry and that this is declining. If a slightly broader definition of pharmacy is assumed so that cough remedies, lozenges and similar products can be included, annual consumption would seem to be of the order of a few tonnes, possibly a maximum of 7–10 tonnes, but similarly there is some evidence of a decline in its use.

Eugenol prices are presented in Table XV.

Future Prospects and the Impact of Synthetics – The demand for clove leaf oil seems likely to remain buoyant, at least for some years. In spite of obvious reluctance on the part of users, this oil has gained ground in the perfumery field – and even to a slight extent in flavouring – at the expense of the dearer and scarcer stem oil, a trend which may well continue. The oil additionally remains unchallenged as a source of eugenol but if its price were to rise much above its present level it might lose a part of this market to cinnamon leaf oil or, ultimately, to a synthetic eugenol which, although not yet a commercial proposition, presents a potential competitive threat.

Table I

CLOVES: Production in Zanzibar, Madagascar and Indonesia

Thousand tonnes

Season	Zanzibar	Madagascar	Indonesia
1960–61	6.5	5.2	7.3
1961–62	15.2	...	7.1
1962–63	5.9	...	6.6
1963–64	20.2	...	7.9
1964–65	3.9	3.9	12.6
1965–66	15.6	...	13.7
1966–67	1.5	5.0	17.2
1967–68	14.2	7.0	3.0
1968–69	15.0	12.0	3.0
1969–70	...	2.5	11.0
1970–71	5.1	...	11.0
1971–72	3.6	3.5	8.0

Sources: *Plantation crops* and *Tropical Products Quarterly* Commonwealth Secretariat.
Mainly based on unofficial estimates in recent years.

... no available estimate

Table II
CLOVES (including stems): Exports from Tanzania[a]

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
TOTAL:	Tonnes	8,535	7,749	11,395	8,159	8,575	13,727	17,710	11,716	7,341	4,769	9,034	11,758
of which to:	£'000	2,414	2,080	3,052	2,191	2,297	3,687	...	3,478	8,869	6,370	10,327	13,468
Belgium & Luxembourg	Tonnes	508	238	...	...	...	...	...	–	–	–	2	–
	£'000	142	64	...	...	...	...	...	–	–	–	3	–
German Fed. Republic	Tonnes	22	415	193	132	66	122	71	15	–	–	–	–
	£'000	6	111	...	...	...	...	...	4	–	–	–	–
Netherlands	Tonnes	52	117	...	...	...	...	...	48	2	2	2	2
	£'000	15	31	...	...	...	...	...	17	3	3	3	4
Spain	Tonnes	–	–	...	...	...	...	...	42	9	11	–	–
	£'000	–	–	...	...	...	...	...	15	15	18	–	–
United Kingdom	Tonnes	130	188	229	163	198	168	183	294	43	31	1	2
	£'000	38	52	...	...	...	...	...	106	71	52	2	4
USSR	Tonnes	–	–	91	71	30	25	508	203	102	–	–	–
	£'000	–	–	...	...	...	...	...	64	162	–	–	–
Bahrain	Tonnes	–	–	...	...	...	...	...	5	4	–	20	–
	£'000	–	–	...	...	...	...	...	2	6	–	33	–
China	Tonnes	–	102	117	284	305	305	305	610	–	–	–	–
	£'000	–	27	...	...	...	...	...	173	–	–	–	–
Hong Kong	Tonnes	–	–	20	960	25	112	406	940	587	660	914	–
	£'000	–	–	...	...	...	...	...	269	270	888	1,041	–
India	Tonnes	478	1,041	467	864	853	1,438	726	228	9	12	124	1
	£'000	136	279	...	...	...	...	...	65	8	10	165	1
Indonesia	Tonnes	4,064	508	5,024	2,235	3,251	9,089	12,584	4,437	3,387	51	5,385	10,899
	£'000	1,152	136	...	...	...	...	...	1,281	4,679	82	6,196	12,463
Japan	Tonnes	198	145	234	188	168	173	41	101	58	65	28	24
	£'000	55	38	...	...	...	...	...	36	95	105	46	39

Table II—continued
CLOVES (including stems): Exports from Tanzania[a]

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Kuwait	Tonnes	—	—	...	...	...	...	...	89	37	30	40	23
	£'000	—	—	...	...	...	...	...	31	62	53	64	29
Pakistan	Tonnes	816	672	1,209	1,041	894	239	335	286	25	14	6	—
	£'000	230	179	...	...	...	...	...	95	41	23	10	—
Saudi Arabia	Tonnes	—	—	...	...	...	...	...	125	7	37	4	5
	£'000	—	—	...	...	...	...	...	44	9	60	6	5
Singapore and Malaysia	Tonnes	970	2,167	1,316	117	56	—	1,174	3,448	2,780	3,663	2,441	688
	£'000	273	585	...	...	...	—	...	974	2,963	4,760	2,646	789
South Yemen	Tonnes	—	—	...	...	...	...	...	62	6	4	2	26
	£'000	—	—	...	...	...	...	...	20	10	7	4	27
Ethiopia	Tonnes	—	—	...	...	...	...	...	78	—	15	—	—
	£'000	—	—	...	...	...	...	...	25	—	24	—	—
Libya	Tonnes	—	—	...	...	...	...	...	20	—	12	10	—
	£'000	—	—	...	...	...	...	...	7	—	20	16	—
Sudan	Tonnes	—	—	218	157	244	188	213	100	3	13	18	7
	£'000	—	—	...	...	...	...	...	36	5	22	29	11
Canada	Tonnes	69	67	...	...	...	...	...	34	17	20	2	2
	£'000	19	18	...	...	...	...	...	13	27	34	3	3
United States	Tonnes	79	545	178	81	142	30	61	252	206	5	5	20
	£'000	22	146	...	...	...	...	...	100	342	8	9	32
Australia	Tonnes	—	—	...	...	...	...	...	26	20	32	8	4
	£'000	—	—	...	...	...	...	...	9	32	51	13	6
New Zealand	Tonnes	—	—	...	...	...	...	...	3	5	12	1	—
	£'000	—	—	...	...	...	...	...	1	8	18	2	—
Other countries	Tonnes	1,149	1,544	2,099	1,866	2,343	1,838	1,103	270	34	80	21	55
	£'000	326	414	...	...	...	...	...	91	61	132	36	55

Sources: 1961–62 Trade Report
Controller of Customs

1963–67 *Plantation Crops*
Commonwealth Secretariat
Yearbook of Int. Trade Statistics UN

1968–72 *Trade Report*
East African Customs and Excise

(a) From Zanzibar in years 1961 to 1967, from Tanzania including Zanzibar from 1968. — Nil or negligible ... Information not available.

Table III

CLOVES: Exports from Madagascar

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
TOTALS:	Tonnes	5,326	4,491	2,054	4,823	4,423	3,373	5,259	12,417	974	5,278	7,496	6,116
of which to:–	£'000	1,233	1,023	560	1,183	1,082	844	1,276	3,303	647	7,467	8,481	6,661
Belgium and Luxembourg	Tonnes	–	–	–	7	8	20	22	21	3	22	160	17
	£'000	–	–	–	2	2	5	6	6	4	35	186	23
Denmark	Tonnes	7	12	7	14	10	22	13	20	3	5	8	–
	£'000	2	3	2	4	2	5	3	6	2	8	9	–
France	Tonnes	422	265	472	247	180	189	261	208	108	287	163	117
	£'000	101	67	127	64	46	49	66	62	142	424	188	163
Greece	Tonnes	17	8	1	9	4	15	32	49	5	1	22	3
	£'000	4	2	–	2	1	4	8	14	4	2	27	4
German Federal Republic	Tonnes	351	217	349	465	557	439	564	734	102	442	401	241
	£'000	82	55	93	118	140	112	143	216	109	718	471	341
Italy	Tonnes	21	7	15	45	75	80	73	67	11	62	71	73
	£'000	5	2	4	11	19	21	18	19	16	97	82	105
Netherlands	Tonnes	64	29	16	75	76	102	86	124	13	157	152	55
	£'000	15	7	4	20	19	26	22	37	15	228	179	76
Spain	Tonnes	–	–	–	–	24	18	16	24	–	2	34	16
	£'000	–	–	–	–	6	5	4	7	–	2	41	23
Sweden	Tonnes	31	1	2	45	37	24	28	20	3	7	17	–
	£'000	7	–	1	12	9	6	7	6	4	10	20	–
United Kingdom	Tonnes	39	–	–	2	2	–	–	40	–	43	122	10
	£'000	8	–	–	1	1	–	–	12	–	68	142	14
USSR	Tonnes	–	–	–	–	–	–	–	200	–	135	250	803
	£'000	–	–	–	–	–	–	–	55	–	207	247	890
Pakistan	Tonnes	–	–	–	–	–	–	–	212	–	46	148	–
	£'000	–	–	–	–	–	–	–	58	–	64	182	–

Table III—continued

CLOVES: Exports from Madagascar

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Hong Kong	Tonnes	31	5	5	65	5	–	–	1,128	–	16	500	–
	£'000	7	1	1	14	1	–	–	295	–	21	630	–
India	Tonnes	–	–	–	–	–	–	–	125	–	35	3	–
	£'000	–	–	–	–	–	–	–	21	–	48	3	–
Indonesia	Tonnes	2,273	1,010	10	1,953	907	44	2,028	1,827	15	10	210	1,394
	£'000	527	237	2	459	204	10	466	477	13	11	215	1,404
Japan	Tonnes	23	2	1	–	–	25	85	90	–	54	65	5
	£'000	5	1	–	–	–	6	21	24	–	76	77	10
Malaysia, Singapore	Tonnes	581	1,620	121	243	442	436	35	5,119	630	2,789	3,794	2,783
	£'000	135	326	30	58	105	104	8	1,275	286	3,554	4,161	2,776
Algeria	Tonnes	36	17	20	50	83	132	54	102	–	80	–	–
	£'000	9	4	5	12	21	33	13	30	–	108	–	–
Dahomey	Tonnes	17	7	–	6	2	4	9	16	–	–	8	–
	£'000	4	2	–	2	1	1	2	4	–	–	9	–
Libya	Tonnes	6	–	10	30	82	101	118	109	–	73	81	6
	£'000	1	–	2	7	20	24	28	30	–	115	96	8
Morocco	Tonnes	216	79	78	154	328	211	270	305	9	29	55	16
	£'000	53	21	22	41	85	54	67	89	12	46	63	23
Nigeria	Tonnes	41	19	35	40	86	160	101	26	5	13	5	9
	£'000	10	5	9	10	22	40	26	8	8	20	6	12
Canada	Tonnes	13	–	–	14	–	5	–	36	–	24	42	40
	£'000	3	–	–	4	–	1	–	9	–	47	49	55
Mexico	Tonnes	–	–	–	16	4	–	10	5	–	–	–	–
	£'000	–	–	–	4	1	–	3	2	–	–	–	–
United States	Tonnes	933	1,092	875	1,270	1,422	1,168	1,339	1,579	53	834	937	482
	£'000	207	266	247	320	356	292	337	464	16	1,127	1,096	659
Other countries	Tonnes	204	101	37	73	89	178	115	231	14	112	248	46
	£'000	48	24	11	18	21	46	28	77	16	431	302	75

Source: Commerce Extérieur
Institut National de la Statistique et de la Recherche Economique

– nil or negligible.

Table IV

CLOVES: Exports from Sri Lanka (Ceylon)

		1961	1962	1963	1964	1965	1966	1967	1968	1969
TOTALS	Tonnes	20	15	31	33	37	50	43	48	234
of which to:—	£'000	10.4	8.1	9.9	5.1	8.9	10.1	6.7	8.7	199.7
German Federal Republic	Tonnes	3	2	7	11	7	7	8	19	25
	£'000	1.1	0.9	0.9	1.3	0.9	1.0	0.8	2.1	16.1
Netherlands	Tonnes	2	2	5	2	1	—	—	—	13
	£'000	1.1	0.9	3.2	0.7	0.6	—	—	—	13.5
United Kingdom	Tonnes	1	—	10	16	19	27	19	18	78
	£'000	0.5	—	1.0	1.7	2.3	3.6	1.6	1.6	57.3
Maldive Islands	Tonnes	5	3	2	2	4	4	5	2	3
	£'000	2.6	1.6	1.5	1.0	2.3	1.5	1.6	1.5	3.4
United States	Tonnes	7	7	4	—	3	4	3	—	12
	£'000	4.7	4.0	2.8	—	2.6	3.1	1.7	—	13.5
Other countries	Tonnes	2	1	3	2	3	8	8	9	103
	£'000	0.4	0.7	0.5	0.4	0.2	0.9	1.0	3.5	95.9

Source: Ceylon Customs Returns
Government Printers

— nil or negligible.

Table V

CLOVES: Imports into United Kingdom

Information not available before date shown		1963	1964	1965	1966	1967	1968[a]	1969[a]	1970	1971	1972
TOTALS	Tonnes	209	180	207	206	233	320	133	147	182	184
of which from:—	£'000	60	52	60	61	68	132	137	221	242	228
Ceylon	Tonnes	10	16	19	22	21	19	74	59	3	32
	£'000	1	2	3	4	3	3	66	69	2	16
Madagascar	Tonnes	—	—	—	—	—	...	...	9	116	52
	£'000	—	—	—	—	—	...	...	11	152	72
West Malaya	Tonnes	1	—	—	3	—	...	...	8	13	25
	£'000	1	—	—	—	—	...	...	15	16	36
Singapore	Tonnes	—	—	—	—	—	...	...	8	14	58
	£'000	—	—	—	—	—	...	...	13	17	81
Zanzibar, Tanzania	Tonnes	192	161	184	176	204	296	50	36	9	1
	£'000	55	47	54	52	60	125	61	62	13	2
Other countries	Tonnes	6	3	4	5	8	...	...	27	27	16
	£'000	3	3	3	5	5	...	...	51	42	21

Source: *The Trade of the United Kingdom*
HM Customs and Excise

[a] Total partly estimated, category includes other spices
. . . Information not available
— nil or negligible.

Table VI

CLOVES (including stems): Re-exports from United Kingdom

information not available before date shown		1963	1964	1965	1966	1967	1968	1969	1970[a]	1971[a]	1972[a]
TOTALS	Tonnes	14	11	10	8	5	...	...	26	18	6
of which to:—	£'000	4.2	3.3	3.1	2.8	1.8	...	...	18.1	12.7	10.2
Irish Republic	Tonnes	...	...	6	2	2	...	...	7	5	2
	£'000	...	...	1.3	0.6	0.4	...	...	3.8	3.6	2.3
Netherlands	Tonnes	...	...	—	—	—	...	...	9	—	—
	£'000	...	...	—	—	—	...	...	2.9	—	—
Japan	Tonnes	...	...	—	—	—	...	...	—	4	—
	£'000	...	...	—	—	—	...	...	—	2.3	—
Jamaica	Tonnes	...	...	—	—	—	...	...	—	7	—
	£'000	...	...	—	—	—	...	...	—	3.1	0.6
Other countries	Tonnes	14	11	4	6	3	...	...	10	2	4
	£'000	4.2	3.3	1.8	2.2	1.4	...	...	11.4	3.7	7.3

Source: *The Trade of the United Kingdom*
HM Customs and Excise

[a] No distinction between exports and re-exports.

...Information not available.

— Nil or negligible.

Table VII

CLOVE OIL: Exports from Tanzania[a]

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
TOTALS	Tonnes	157	122	151	164	109	135	87	204	61	42	23	28
of which to:–	£'000	122	98	118	128	83	70	67	221	104	204	109	106
France	Tonnes	–	–	...	...	...	...	...	1	3	1	–	–
	£'000	–	–	...	...	...	...	...	2	3	4	–	–
Netherlands	Tonnes	5	2	...	...	...	...	...	1	–	–	11	5
	£'000	4	2	...	...	...	...	...	1	–	–	52	20
United Kingdom	Tonnes	61	41	...	...	...	...	...	132	18	4	3	–
	£'000	48	35	...	...	...	...	...	136	28	20	18	–
United States	Tonnes	89	76	...	...	...	...	...	65	38	37	8	23
	£'000	69	59	...	...	...	...	...	79	70	180	39	86
Australia	Tonnes	–	2	...	...	...	...	...	2	2	–	–	–
	£'000	–	1	...	...	...	...	...	1	2	–	–	–
Other countries	Tonnes	2	1	...	...	...	...	...	3	–	–	1	–
	£'000	1	1	...	...	...	...	...	2	1	–	–	–

Sources: 1961–62 Trade Report
Controller of Customs

1963–67 *Yearbook of International Trade Statistics*
United Nations

1968–72 Trade Report
East African Customs & Excise

a From Zanzibar in years 1961–67
From Tanzania including Zanzibar from 1968.

... Information not available.

– Nil or negligible.

Table VIII

CLOVE OIL: Exports from Madagascar

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
TOTALS	Tonnes	640	778	809	892	810	877	730	1,158	1,187	962	1,009	996
of which to:–	£'000	429	560	530	561	467	574	538	1,221	1,442	1,041	1,130	1,196
France	Tonnes	241	240	191	222	184	169	192	263	312	300	214	194
	£'000	158	170	121	140	105	107	144	251	333	288	216	228
German Federal Republic	Tonnes	27	30	45	56	9	15	15	30	29	29	10	4
	£'000	18	22	29	35	5	9	10	29	35	32	8	4
Italy	Tonnes	–	2	2	6	5	6	7	11	14	14	5	7
	£'000	–	1	1	4	2	4	5	10	16	16	4	8
Netherlands	Tonnes	27	56	86	58	74	63	35	74	87	61	57	65
	£'000	19	37	56	37	42	40	26	67	111	68	60	69
Switzerland	Tonnes	–	4	12	27	12	31	12	2	9	5	4	2
	£'000	–	3	8	17	7	20	9	2	12	7	4	2
United Kingdom	Tonnes	25	45	48	97	93	124	143	156	129	132	111	99
	£'000	16	31	32	61	53	80	106	151	153	143	119	112
Japan	Tonnes	69	38	44	30	38	68	62	98	120	52	35	54
	£'000	50	27	30	20	22	46	48	102	155	61	35	59
United States	Tonnes	240	356	376	386	376	392	257	492	442	350	559	523
	£'000	161	263	249	241	219	263	185	571	565	404	669	663
Australia	Tonnes	3	5	2	5	6	3	3	6	7	5	2	4
	£'000	2	3	1	3	4	2	2	5	8	5	3	5
Other Countries	Tonnes	8	2	3	5	13	6	4	26	38	14	12	44
	£'000	5	3	3	3	8	3	3	33	54	17	12	46

Source: Commerce Extérieur
Institut National de la Statistique et de la Recherche Economique

– nil or negligible.

Table IX

CLOVE OIL: Imports into United Kingdom

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
TOTALS	Tonnes	121	109	115	148	134	150	157	234	134	172	171	286
of which from:–	£'000	116	106	107	129	97	122	132	303	196	244	231	333
France	Tonnes	–	9	4	1	6	–	–	7	6	13	25	21
	£'000	–	7	4	1	4	–	–	9	9	22	38	44
Indonesia	Tonnes	–	–	–	–	–	–	–	–	1	32	46	123
	£'000	–	–	–	–	–	–	–	–	–	30	43	101
Madagascar	Tonnes	60	54	54	89	94	98	110	127	115	112	89	112
	£'000	45	42	39	64	58	66	85	162	156	134	104	138
Zanzibar, Tanzania	Tonnes	59	46	56	56	31	50	45	100	12	3	3	1
	£'000	69	57	63	63	32	56	45	131	25	17	20	3
Australia	Tonnes	–	–	–	–	–	–	–	–	–	6	6	12
	£'000	–	–	–	–	–	–	–	–	–	10	14	28
Other Countries	Tonnes	2	–	1	2	3	2	2	–	–	6	2	17
	£'000	2	–	1	1	3	–	2	1	6	31	12	19

Source: *The Trade of the United Kingdom*
HM Customs and Excise

– nil or negligible

Table X

CLOVE OIL: Re-exports from United Kingdom

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970[a]	1971[a]
TOTALS	Tonnes	14	12	14	15	17	50	38	25	28	...	...
of which to:—	£'000	16.7	14.6	18.1	17.3	19.7	55.6	42.3	41.3	51.5	...	...
German Federal Republic	Tonnes	...	...	...	...	—	5	5	3	—		
	£'000	...	...	...	...	—	3.5	3.6	3.0	—		
Netherlands	Tonnes	...	...	...	...	2	10	3	1	1		
	£'000	...	...	...	...	2.4	10.4	3.2	2.4	1.5		
Switzerland	Tonnes	...	...	...	...	—	6	5	4	—		
	£'000	...	...	...	...	0.3	6.5	5.3	6.4	1.0		
South Africa	Tonnes	5	4	...	...	2	4	1	5	12		
	£'000	4.3	3.7	...	...	1.4	3.0	1.5	8.0	19.2		
United States	Tonnes	...	...	...	...	5	17	20	7	5		
	£'000	...	...	...	...	5.8	18.6	21.7	11.7	12.1		
Australia	Tonnes	...	...	...	...	2	3	3	1	2		
	£'000	...	...	...	...	2.4	5.1	3.2	1.9	3.9		
Other Countries	Tonnes	9	8	14	15	6	5	1	4	8		
	£'000	12.4	10.9	18.1	17.3	7.4	8.5	3.8	7.9	13.8		

Source: *The Trade of the United Kingdom*
HM Customs and Excise

[a] Not separately shown
— nil or negligible.
. . . Information not available

Table XI

CINNAMON LEAF OIL: Apparent Imports into United Kingdom[a]

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
TOTALS	Tonnes	52	30	39	43	31	13	11	30	...	...
of which from:—	£'000	29	20	26	32	24	10	9	27	...	...
Ceylon	Tonnes	24	7	2	8	5	6	5	25	29	...
	£'000	12	4	1	6	5	5	4	20	20	...
Seychelles	Tonnes	28	23	37	35	26	7	6	5	...	2
	£'000	17	16	25	26	19	5	5	7	...	4

Sources: Ceylon Customs Returns (Govt Press)
Seychelles Trade Report (HM Customs and Harbours)

[a] Recorded exports consigned to United Kingdom

... Information not available

Table XII

CLOVES: Quarterly average prices and annual range

£ and new pence per kg

		I	II	III	IV	Annual Low	Range High
Zanzibar cif shipment	1961	0.30	0.30	0.30	0.30	0.30	0.30
	1962	0.31	0.32	0.32	0.32	0.30	0.33
	1963	0.32	0.33	0.33	0.33	0.32	0.33
	1964	0.33	0.31	0.31	0.31	0.31	0.33
	1965	0.31	0.31	0.31	0.31	0.31	0.31
	1966	0.31	0.31	0.31	0.31	0.31	0.31
	1967	0.31	0.31	0.31	0.31	0.31	0.31
	1968	0.35	0.36	0.43	0.35	0.35	0.44
	1969	1.33	1.82	1.82	1.82	0.35	1.82
	1970	1.83	2.23	2.54	1.72	1.72	2.54
	1971	1.72	1.74	1.74	1.74	1.72	1.74
	1972[a]	1.74	1.74	1.74	1.74	1.74	1.74

Sources: *Perfumery and Essential Oil Record* (*Soap Perfumery and Cosmetics* after June 1969)
Flavour Industry 1972 Figures

[a] Spot prices

Table XIII

CLOVE BUD OIL: Quarterly average prices and annual range: cif London

£ and new pence per kg

		I	II	III	IV	Annual Low	Range High
English Distilled (Spot)	1961	3.09	3.09	3.05	2.98	2.98	3.09
	1962	2.98	2.98	2.98	2.98	2.98	2.98
	1963	2.98	2.98	2.98	2.98	2.98	2.98
	1964	3.09	3.16	2.87	2.87	2.87	3.31
	1965	2.98	3.09	3.09	3.16	2.92	3.20
	1966	3.09	3.09	3.09	3.09	3.09	3.09
	1967	3.09	3.09	3.09	3.09	3.09	3.09
	1968	3.86	3.64	3.93	5.11	3.53	6.40
	1969	13.60	14.88	14.88	14.88	11.03	14.88
	1970	16.26	21.50	21.50	21.50	15.98	21.50
	1971	20.39	21.50	21.50	20.10	18.70	21.50
	1972	21.50	21.50	21.50	21.50	21.50	21.50
	1973	21.50	21.50	21.50	–	21.50	21.50
	1974	21.50					
Zanzibar not rectified	1966	0.66	0.65	0.70	0.78	0.65	0.79
	1967	0.78	0.97	0.99	1.02	0.79	1.08
	1968	1.30	1.44	1.33	1.69	1.13	2.43
	1969	3.49	3.59	3.59	3.59	3.31	3.59
	1970	3.59	3.59	–	–	3.59	3.59
	1971	–	–	–	–		

Sources: *Perfumery and Essential Oil Record* (*Soap, Perfumery and Cosmetics* after June 1969)
Flavour Industry for 1972/74 Figures

– not quoted

Table XIV

CLOVE LEAF OIL: Quarterly average prices and annual range: cif London

£ and new pence per kg

		I	II	III	IV	Annual Range Low	Annual Range High
Madagascar	1961	0.77	0.73	0.73	0.75	0.72	0.77
	1962	0.76	0.79	0.76	0.57	0.73	0.83
	1963	0.72	0.70	0.70	0.71	0.69	0.73
	1964	0.75	0.70	0.71	0.65	0.64	0.83
	1965	0.64	0.65	0.63	0.64	0.61	0.66
	1966	0.65	0.70	0.74	0.76	0.64	0.77
	1967	0.71	0.86	0.99	1.05	0.69	1.13
	1968	1.24	1.38	1.34	1.33	1.19	1.44
	1969	1.53	1.55	1.55	1.29	1.12	1.55
	1970	1.27	1.29	1.30	1.20	1.16	1.30
	1971	1.11	1.43	1.43	1.31	1.11	1.43
	1972	1.20	1.20	1.18	1.18	1.18	1.20
	1973	1.40	1.65	1.65	–	1.40	1.65
	1974	3.25					
Seychelles forward	1961	0.77	0.77	0.73	0.70	0.72	0.77
	1962	0.71	0.76	0.79	0.75	0.72	0.79
	1963	0.73	0.70	0.72	0.73	0.70	0.75
	1964	0.87	0.94	0.94	0.94	0.73	0.94
	1965	0.94	0.94	0.94	0.71	0.65	0.94
	1966	0.65	0.65	0.91	0.91	0.65	0.91
	1967	0.91	0.91	0.91	0.91	0.91	0.91
	1968	0.91	1.00	1.19	1.19	0.91	1.19
	1969	1.19	–	–	–		
	1970	–	–	–	–		
	1971	–	–	–	–		

Sources: *Perfumery and Essential Oil Record* (*Soap, Perfumery and Cosmetics* after June 1969)
Flavour Industry for 1972/74 Figures

– not quoted

Table XV

EUGENOL: Quarterly average prices and annual range: cif London

£ and new pence per kg

	I	II	III	IV	Annual Range Low	High
1961	2.43	2.43	2.43	2.43	2.43	2.43
1962	2.10	2.10	2.10	2.10	1.99	2.21
1963	2.24	2.32	2.26	2.18	1.99	2.43
1964	2.18	2.18	2.18	2.18	2.04	2.32
1965	2.18	2.18	2.18	2.18	2.04	2.32
1966	2.18	2.18	2.18	2.18	2.04	2.32
1967	2.18	2.18	2.18	2.18	2.04	2.32
1968	2.18	2.71	2.98	2.98	2.04	2.98
1969	2.98	2.98	2.98	2.98	2.98	2.98
1970	3.04	3.15	3.26	3.31	1.35	1.50
1971	3.31	3.32	3.32	3.32	3.31	3.32
1972	3.32	3.32	3.32	2.88	2.45	3.32
1973	2.45	3.35	3.35	–	2.45	3.35
1974	4.50					

Sources: *Perfumery and Essential Oil Record* (*Soap, Perfumery and Cosmetics* after June 1969)
Flavour Industry 1972–1974 Figures

– not quoted

Table XVI

CINNAMON LEAF OIL: Quarterly average prices and annual range: cif London

£ and new pence per kg

		I	II	III	IV	Annual Range Low	Annual Range High
Ceylon	1961	1.35	1.33	1.25	1.25	1.22	1.44
	1962	1.24	1.27	1.33	1.20	1.16	1.33
	1963	1.34	1.38	1.33	1.41	1.27	1.49
	1964	—	2.67	2.01	2.01	1.93	3.14
	1965	2.44	2.68	2.90	2.94	2.01	3.03
	1966	2.85	2.65	2.26	2.04	1.99	2.92
	1967	1.95	1.33	1.86	1.87	1.77	1.99
	1968	1.97	2.02	2.00	1.86	1.82	2.01
	1969	1.77	1.77	1.77	1.60	1.60	1.77
	1970	1.60	1.60	1.66	1.60	1.60	1.82
	1971	1.77	2.15	1.88	1.88	1.60	2.15
	1972	1.33	1.25	1.30	1.30	1.25	1.33
	1973	1.69	1.69	1.69			
Seychelles	1961	0.78	0.77	0.70	0.66	0.66	0.85
	1962	0.69	0.82	0.79	0.79	0.66	0.86
	1963	0.78	0.78	0.78	0.78	0.77	0.79
	1964	0.79	0.89	0.98	0.99	0.79	0.99
	1965	0.99	0.96	0.86	0.84	0.84	0.99
	1966	1.08	1.22	1.22	1.22	0.82	1.22
	1967	1.14	1.26	1.49	1.50	1.00	1.55
	1968	1.75	2.18	2.18	2.09	1.85	2.21
	1969	2.15	2.18	2.18	2.18	2.10	2.21
	1970	2.10	2,10	1.99	2.07	1.98	2.20
	1971	2.04	2.09	—	—	2.04	2.09
	1972	2.85	2.85	2.85	2.85	2.85	2.85
	1973	—	2.95	—			

Sources: *Perfumery and Essential Oil Record*
(*Soap, Perfumery and Cosmetics* after June 1969)
Flavour Industry for 1972 Figures

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